DOCUMENT RESUME

ED 038 337 SP 003 725

AUTHOR Livingstone, D. W.
TITLE Organizational Innovativeness. A Conceptual Outline for Comparative Studies.
PUB DATE Feb 70
NOTE 50p.

EDRS PRICE EDRS Price MF-$0.25 HC-$2.60
DESCRIPTORS Administrative Organization, *Conceptual Schemes, *Innovation, Measurement, Models, Organizational Change, *Organizations (Groups), *Research Design, Research Methodology, *Research Needs, Systems Analysis

ABSTRACT

This paper presents a summary and analysis of the current state of research in the field of organizational innovativeness and develops a provisional conceptual outline of the overall process and characteristics of organizational innovation and the general factors which may be related to innovativeness. Based on the "summaries approach" to innovativeness (an approach the author views as indispensible to the development of empirical studies with a radically different focus than those now available), the outline is designed to enable the systematic comparison of existing theories and findings and to indicate more clearly the areas in which intensive research is needed. In presenting and illustrating the proposed research strategy, the author (1) offers a general context for innovation by outlining basic components of the social organization and its environment; (2) defines organizational innovation (particularly as it is distinct from other change phenomena); (3) distinguishes stages and dimensions of the process and other descriptive characteristics; (4) examines selected attributes of the contextual components as potential universal determinants of innovativeness (in this case, innovative frequency) and the empirical evidence related to each; and (5) envisages future developments in the field. Included with the paper is a 115-item list of references. (JES)

ED038337

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ORGANIZATIONAL INNOVATIVENESS

A Conceptual Outline for

Comparative Studies

D.W. Livingstone

The Ontario Institute for

Studies in Education

February, 1970

SP003725

TABLE OF CONTENTS

INTRODUCTION 1

THE CONTEXT OF ORGANIZATIONAL INNOVATION 2

A CONCEPTION OF ORGANIZATIONAL INNOVATION 6

DEFINING ORGANIZATIONAL INNOVATION 6

DIMENSIONS OF ORGANIZATIONAL INNOVATION 10

Innovative Paths: Stages in the Innovative Process and Levels of Action 10

Other Descriptive Characteristics 14

Measures of Innovativeness 17

DETERMINANTS OF ORGANIZATIONAL INNOVATIVENESS 21

UNIVERSAL DETERMINANTS AND INNOVATIVE FREQUENCY: ILLUSTRATIVE PROPOSITIONS 22

Organizational Determinants 23

Environmental Determinants 36

PROSPECTUS 38

REFERENCES 40

INTRODUCTION

Generalizations about organizational innovativeness are quite plentiful, but even if we restrict our view to research studies of one particular organization, such as the school system, many of the tentative conclusions appear to be confounding or contradictory (e.g. Miles, 1963). Conflicting findings may be a healthy sign in the early stages of any field of inquiry. But, while empirical research on innovation has continued to proliferate, cumulative theoretical advance has been largely absent. This paper is based on the presumption that conceptual analysis to identify in broadest outline the process and characteristics of organizational innovation and general factors which may be related to innovativeness could be especially valuable at this point. Such provisional conceptual schemes may both enable the systematic comparison of existing theories and findings and also indicate more clearly where the greatest gaps in our knowledge are.

There has been no lack of concept formation with regard to either the process, the characteristics, or the determinants of innovativeness, respectively (see especially Bhola, 1965 a; Rogers and Shoemaker, 1968), but efforts to construct integrative frameworks are very rare.[1] In this paper, we will attempt to combine a number of the conceptual distinctions suggested by innovation researchers and by general organizational theorists into a relatively comprehensive framework for studying organizational innovativeness. In the first part of the paper, a general context for innovation is offered by outlining basic components of the social organization and its environment. Next, organizational innovation is defined, the stages in the process distinguished and other descriptive characteristics considered.

---

[1] The most notable exceptions are the works of Bhola (1965b) and Wilson (1966). The former focusses on the diffusion of innovations, and the latter is restricted to analyzing the innovativeness of an organization without considering its environment.

Then some general attributes of the contextual components are selected as potential influences on innovativeness, and some of the existing empirical evidence is considered. Finally, future developments in our understanding of organizational innovation are envisaged.

THE CONTEXT OF ORGANIZATIONAL INNOVATION

With a few quite recent exceptions (Rice, 1963; Wilson, 1966), innovation researchers have shown little interest in outlining their conceptions of "social organization". Speaking of organizational analysis in general, Bakke (1959, p. 16) has noted:

> "A survey of the current literature related to what is beginning to be called 'organizational behavior' reveals a relatively small concern with the clear definition of the nature and structure of a social organization ... seldom does one find a careful and systematic description of the nature and structure of the 'thing' with whose internally and externally directed activity the hypotheses are concerned."

The utility of such definitions for the significant development of organizational theory has not been self-evident. The issue has been posed as follows:

> "On the one hand it seems cavalier, even outrageously slipshod, to try to proceed to a careful examination of any phenomena without an attempt to define, that is to understand and agree upon, what the object of examination is, at least in general terms and as now understood. On the other hand, one can argue persuasively that the scientific enterprise has no close and necessary relationship to conventional definitions, that the verbal difficulties outweigh the scientific gain, that the problem of definition can really only be solved by by-passing it and proceeding to activities that eventually will 'define' in meaningful, operational terms." (Waldo, 1961, p. 219)

The positivistic approach has certainly produced many informative descriptive studies of innovation as well as an immense number of hypotheses for further study. But it is precisely the promise of further study to move beyond this exploratory level that concerns us here. At a comparable stage in many now well-developed scientific disciplines, clearly defined concepts of the "thing" whose behavior was

being studied have vitally influenced the nature of the hypotheses scientists judged important, formulated and tested (e.g. human anatomy in medicine, living organisms in biology, matter in physics). Similarly, it has been observed that theories of social change in general would be either impossible to formulate or, if formulated, empirically uninteresting if they did not specify what is changing (Moore, 1960). At the very least, as long as innovation researchers' notions of "organization" remain implicit, whatever cumulative efforts do occur will not be able to discriminate among findings based on widely varied organizational settings and may result in some highly confounded generalizations.

It is not the nominal definition of the "thing" per se but the classification of components that has usually been of vital important. Probably few researchers would take serious issue with Bakke's (1959, p. 37) definition of a social organization as:

> "... a continuing system of differentiated and coordinated human activities utilizing, transforming, and welding together a specific set of human, material, capital, ideational, and natural resources into a unique problem-solving whole engaged in satisfying particular human needs in interaction with other systems of human activities and resources in its environment."

Probably even fewer would find it very helpful. The more important feature of each general conception of human organization would be to offer a systematic framework of the principal parts of the organization and environment, precise and structured enough so that more particular variables and hypotheses could be ordered within it. As Bakke (1959, p. 20) says:

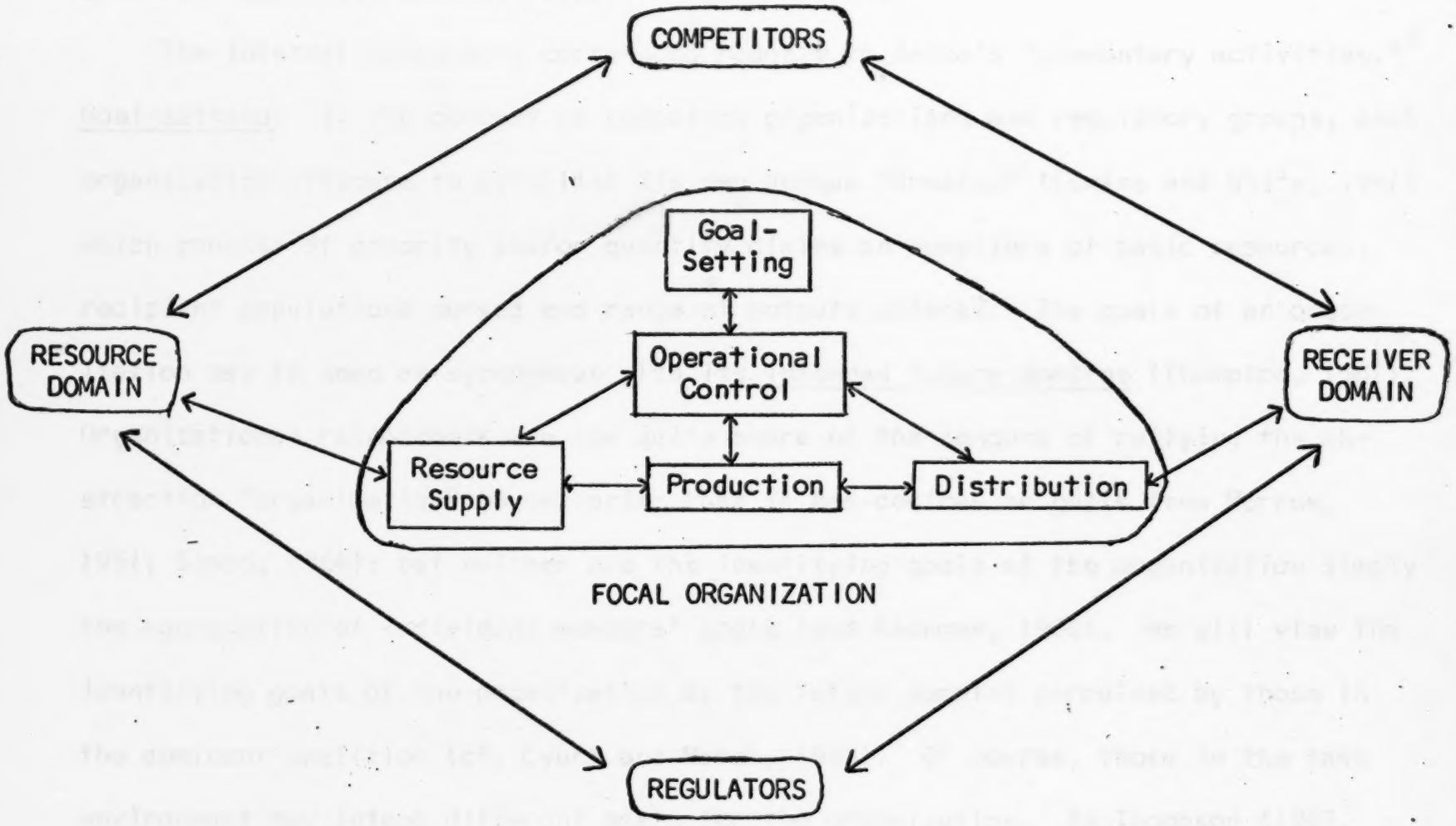
> "... unless the multitude of activities carried on within an organization, and the factors affecting and affected by these are related to some systematic framework including both, we are faced with an overwhelming set of detailed variables."

The framework of components suggested here is illustrated by Figure 1. It has been derived primarily from the conceptual work of Bakke (1959) and of Dill (1958).

FIGURE 1

A SKELETAL FRAMEWORK FOR

ORGANIZATIONAL ANALYSIS



The general notion of "organizational environment" is a residual and uninstructive one, referring merely to "everything else" (Thompson, 1967, p. 27). Several inter-organizational theorists have similarly distinguished the most pertinent environmental components (Dill, 1958; Levine and White, 1961; Evan, 1966).[2] Dill's conception of task environment is made up of four principal parts: (1) suppliers of labor, materials, finances, ideas, and natural resources relevant to the focal organization's activities; (2) recipients of outputs (i.e. "markets"); (3) competitors for both resources and recipients; and (4) regulatory groups (e.g. governmental agencies, unions, interfirm associations).

The internal components correspond roughly to Bakke's "elementary activities."[3] Goal-setting: in the context of competing organizations and regulatory groups, each organization attempts to establish its own unique "domains" (Levine and White, 1961) which consist of priority and/or quantity claims on suppliers of basic resources, recipient populations served and range of outputs offered. The goals of an organization may be seen as synonymous with its intended future domains (Thompson, 1967). Organizational researchers are now quite aware of the dangers of reifying the abstraction "organization" by declaring that it has desires or goals (see Perrow, 1961; Simon, 1964); but neither are the identifying goals of the organization simply the aggregation of individual members' goals (see Rhenman, 1968). We will view the identifying goals of the organization as the future domains perceived by those in the dominant coalition (cf. Cyert and March, 1963). Of course, those in the task environment may intend different goals for the organization. As Thompson (1967,

---

[2] These papers, as well as those of Stinchcombe (1965) and Emery and Trist (1965), have stimulated much of the recent literature on inter-organizational analysis. See the bibliographies by Collver (1967) and Turk (1967).

[3] See Bakke (1959, pp. 36-58) for much more elaborate descriptions of these activities with empirical examples. It should be noted that I have only drawn on Bakke's elementary activities, and not his complex combinations, i.e. "synergic" activities (see his outline, p. 73). For similarly holistic concepts of organization, see for example Malinowski (1943); Parsons (1956a, 1956b); Stogdill, (1966).

pp. 127-28) observes:

> Goals for the organization will usually be multiple and may be held by individuals or categories having no affiliation with the organization. In this way clientele may seek a different sort of service from the organization; investors may seek a more profitable or safer domain as illegitimate; or members of different departments within the organization may have conflicting views of desired future domains. Considering goals as intended future domains has the utility that it allows us to consider that non-members may have goals for the organization and, in fact may be quite active in trying to change an organization's domains.

Resource supply: acquisition, maintenance, transformation, development and renewal of the basic resources used in performing the organization's work. More specifically, labor supply activities involve the recruitment and in-service training of the organization's work force. Material supply activities refer mainly to the acquisition and maintenance of raw materials, equipment and, plant employed in operation of the organization. Finance supply activities are the acquisition and servicing of capital inputs. Idea supply activities - the "heartland" of organizational innovation - involve the search for and development of ideas which may be relevant for the organization's operation. Natural resources supply activities perpetuate useful natural resources and access to them, and adapt them to the requirements of other activities.

Production and distribution of outputs: these sequential activities, as Bakke (1959, p. 54) observes, "... constitute the central core of operations or flow of work without which all other activites are meaningless." The distribution activities may include inventory and storage of some outputs as well as dispersement into the receiver domains.

Operational control: directing, motivating, evaluating, and transmitting information for all other organizational activities. Directive activities initiate action and specify the type and intention of action for people and machines.

Motivation activities reward and penalize behavior, attempting to make it conform to that desired by those administering rewards and penalties. Evaluation activities appraise performers, performances, and results against recognized standards. Information transmission activities provide agents with premises and/or data required to perform other activities.

The arrows in Figure 1 are merely intended to suggest the most predominant direct linkages between the various components. Without elaborating this skeletal framework any further here, I contend that it is both inclusive enough and precise enough to facilitate comparative studies of a wide variety of organizations. Assuming this context, we will now look at the concept of organizational innovation.

A CONCEPTION OF ORGANIZATIONAL INNOVATION

Students of organizational innovation have seldom offered a careful definition of their central concept. In more general inquiry, an innovation has been defined as "any thought, behavior, or thing that is new because it is qualitatively different from existing forms" (Barnett, 1953, p. 7). Presumably using some similar notion implicitly, the typical researcher has selected the organizational changes he wishes to study, and listed and described them in particularistic terms with little regard for systematic classification. Thus there are several immediate conceptual needs: (1) to develop a definition of organizational innovation adequate to distinguish such phenomena from related organizational dynamics; (2) to specify general criteria for classifying and measuring organizational innovation.

DEFINING ORGANIZATIONAL INNOVATION

We can begin by citing several definitions which have recently been offered for innovation in organizational contexts. Bhola (1965b, p. 5) notes that "an innovation

is always something definable that is 'new' to an adopter individual, group or system." Wilson (1966, p. 1966) suggests that, "an innovation ... is a 'fundamental' change in a 'significant' number of (organizational) tasks." Thompson (1965, p. 2) sees it as, "the generation, acceptance, and implementation of new ideas, processes, products or services." Mohr (1969, p. 112) defines innovation as, "the successful introduction into an applied situation of means or ends that are new to that situation." Each of these notions fails to distinguish innovation from some other form of organizational change, and the same ambiguity seems to pervade the empirical literature.

I shall define an organizational innovation as a deliberate new combination of the organization's activity structures. The following discussion is intended to clarify the differences between innovation and several other change phenomena.

Organizational innovations are changes which are consciously executed by organizational agents and as such may be contrasted with organizational drift - new structural combinations which, though no less important for the long term career of the organization than deliberate change, go unnoticed by those who presently direct its affairs (Carlson et al, 1965a, p. v). No assumption can be made here regarding the relative efficacy of explicit, purposeful reorganization, i.e. innovation, and more ad hoc, automatic adaptations under similar conditions. Existing evidence does not suggest that deliberate changes are any more effective (McNulty, 1962). Furthermore, it is not assumed that innovation per se or organizational innovations that are actually implemented are always in the organization's best interests.

Quantitative variations per se, growth or contraction, are not innovations. As Barnett (1953, p. 9) states: "Innovation does not result from the addition or subtraction of parts. It takes place only when there is a recombination of

them." The square-cube law notwithstanding (Haire, 1959; Levy and Donhowe, 1962), a corporation may expand and duplicate its operations considerably without recombining its basic elements, although quantitative variations often do necessitate innovation in order for the entity to continue functioning (e.g. McNulty, 1962).

Pattern reversion is the return to a previously developed form. In reality, the distinction is seldom very clear. If, for example, a "Christianized" congregation of agrarian tribesmen reacts to a series of crop failures by reviving their former primitive religion, it is probable that this indigenous form will be combined with vestiges of Christianity rather than assuming its exact prior identity. On the other hand, if a factory which has been producing military equipment during wartime then reverts to making farm implements, there may be sudden, severe disjunctions regarding domains and activities, but the pre-existing operation could soon be re-established in identical form. If the deliberate adaptive response of an organization results in a structural form which has previously been used in other organizations, this is not necessarily a patterned reversion. As long as the structural form has neither been used in, nor existed in the explicit switching rules of, this given organization it will be viewed here as an organizational innovation.[4]

Finally, the relationship between technological innovation and organizational innovation should be clarified. Technological innovations - new products or processes - do not necessarily coincide with structural changes in organizational activities. If a soap company, for instance, brings out a "new" detergent with a

---

[4]For more specific analyses it will be necessary to distinguish among categories of organizational innovation; that is, between unique "creative" innovations and various adoptive responses such as imitation and rediscovery. See Schumpeter (1947) and, especially, Redlich (1951) on these conceptual distinctions.

lower proportion of phosphates and a different name, the organization's production and distribution, resource supply, control, and goal structures could all still retain their prior forms. Most generally though, technological innovations are closely related to structural changes (e.g. Scott et al, 1956; Phillips, 1956; Smelser, 1959; Hill and Harbison, 1959; Mann and Williams, 1960).

Yet, after making these conceptual distinctions, it is evident that the above definition does not preclude a great many very trivial changes. It may be some solace to observe with Barnett (1953, p. 8) that, "the same novelty will be regarded in one situation as trivial, whereas in another it will assume major significance." There appears to be no precise, a priori way for a researcher to distinguish significant changes from trivial ones. A number of classifications have been constructed in general studies of inventions attempting to distinguish basic or extensive inventions from intensive, developmental ones and marginal improvements (Rossman, 1931; Gilfillan, 1935; Bennett, 1943; Nelson, 1959). The researchers characteristically have noted the self-evident fact that basic inventions are subject to more uncertainty and then have retreated into historical illustrations.[5] In one of the few notable theoretical works to date on organizational innovation, Wilson (1966) suggests that whether an innovation is "significant" or not can only be determined by the organization itself. Such a relativistic posture by itself does not promise much more theoretical fruit than the typical empiricism regarding this topic. On the contrary, I believe that the researcher may reduce his dependence on the organizational representative's own

---

[5] Taking an extended historical perspective allows one to deal with innovations whose implications have more nearly "run their course" and makes the judgment of significance easier (e.g. Jewkes et al, 1958). This strategy will be extremely useful for the study of organizational innovations where adequate data are available.

subjective, empirical judgments by attending to the second immediate and rather obvious need regarding the concept of organizational innovation -- the development of explicit sets of dimensions on which these innovations may be classified.

DIMENSIONS OF ORGANIZATIONAL INNOVATION

There are, of course, many discussions of the descriptive features of change or innovation in social science (see Bhola 1965a, pp. 14-17, 78-87; 1965b, passim). Drawing on this literature, I will suggest several fundamental dimensions for classifying organizational innovations -- with special attention to the concept of "innovative stages". Then a number of measures of organizational innovativeness will be considered.

Innovative Paths: Stages in the Innovative Process and Levels of Action

We may think of the process of organizational innovation as occuring in four conceptually distinct stages: (1) invention, (2) proposal, (3) decision and (4) implementation. Several of those researchers who have previously focussed on the organizational innovation process per se (rather than on the inter-unit diffusion of particular innovations) have suggested similar stages. Farnsworth (1940), after studying educational innovations, suggested the following general pattern: recognition of need, proposal, interest agitation, trial demonstration, increased agitation, official recognition, facilitated development. Zand et al (in press) see the process as consisting of: (1) identification, (2) diagnosis, (3) solution-testing, (5) decision, and (6) implementation. Wilson's scheme (1966) is essentially identical to the present one except that he does not distinguish between adoption decision and implementation.

Invention is the creation of an intimate linkage or fusion of two or more ideas not previously joined in just this way, resulting in a qualitatively distinct whole.[6] In the present context, organizational invention is the conception of a new combination of activity structures. Such conceptions may be highly ephemeral and certainly are not always converted into proposals.

A proposal for organizational innovation, the embodiment of the invention, may occur in many forms from an informal suggestion to the elaborate blueprint of a formal planning committee, perhaps both in the course of development of the same innovation. In fact, an organizational innovation may bounce between the conception and proposal stages, and even be given trial applications, being refined a number of times, before it finally is accepted or rejected. In any case, it is probably true that almost anyone can think up an invention, and that making it workable once it is conceived is generally more demanding of both ability and resources (e.g. Weisner, 1966, pp. 15-20). As Barnett (1953, p. 230) observes:

> " Practically every invention does in fact necessitate more than one innovative step. The initial conception may be simple, but its realization usually entails numerous contributory adjustments ..."

Once a proposal has been made, it is subject to the innovation decision process.[7] That is, by one of a large number of paths each proposal ultimately is either adopted, rejected or ignored by an effective decision-making unit. If the proposal must be channeled to a formal decision-making unit, an intermediary in the organizational chain of communication may block it; if it reaches the

---

[6] Barnett's careful analysis of the mental processes involved in the "inventive reorganization of data" (1953, Part III) deserves the close attention of innovation theorists, as does his entreaty that we must begin to think in terms of ideas rather than things in order to discover the nature of (inventions) (1953, p. 181 ff., and Appendix, "On Things"). See also Hagen (1962, p. 30 ff.) on creativity and innovation.

[7] This stage has been the predominant concern of empirical research on organizational innovation, as well as all other types of innovation research.

attention of such a unit, the proposal may be ignored; it may, on the other hand, attract enough interest to warrant an evaluation, perhaps involving trial applications, and then a decision to adopt or reject. In a general review of the adoption of innovations, Rogers (1962) distinguished five sub-processes within the innovation decision process, generally occuring in the following order: awareness, interest, evaluation, trial, and decision. But other studies emphasizing adoption by coercion and directive (e.g. Couch, 1964) have suggested many important cases in which some of these sub-processes appear to be either reversed or missing entirely. Subsequently, more careful attention has been devoted to types of decisions, their structural contexts and consequences (Rogers, 1965; Bhola, 1965a, pp. 52-72; Rogers and Shoemaker, 1967, p. 19 ff.).

Certainly in an organizational context it is often the case that the unit which decides whether to adopt a given innovation is not identical with the unit designated to put it into practice. The most immediate consequence of the decision stage is that the intended <u>implementing</u> unit either accepts, tolerates, rejects, or ignores the instruction of the decision unit regarding the innovation in question. The present distinction between the decision and implementation stages in organizational innovation is comparable to Lin's (1967) typology differentiating anticipatory legitimation and adoption in organizations, except that I conceive of legitimation as essentially a posterior function residing in the implementing unit rather than predominantly one granted <u>a priori</u> to the unit which decides whether to adopt the innovation. Anticipatory legitimation by intended implementing units may, of course, provide encouragement, support, even an enabling function (or critical opposition) for an innovation, but these units -- unless identical with decision units -- are generally less directly concerned with judging proposals than in coping with their application. An implementing unit's

reaction to the decision unit's rejection of a popular proposal, or its superficial tolerance of an adopted innovation, for example, may profoundly influence the fate of any given innovation, as well as the organization's long-range innovative propensity. The general failure to study this stage of innovation is implied in Bhola's (1965a, p. 20) observation that:

> "The question of life span or process cycle of an innovation has not been discussed anywhere in the literature. When does an innovation cease to be an innovation? How does it change from an innovation into a ... norm? This we do not seem to know." 8

Much of the inconsistancy and confusion regarding innovative stages may be attributed to a failure to take account of the "structural contexts" in which the innovative process is occuring. Organizational theorists commonly distinguish three levels of behavior in organizations: individual, group, and organizational levels. Innovation researchers such as Katz (1962), Bhola (1965b. p. 17) and Lin (1967, p. 5) have brought these different levels of action into their typologies of the process. As Lin (1967, p. 3) observes concerning the decision stage:

> "There is the decision process which involves only the individual member as the adopting unit and there is the process where the organization authority decides innovation assimilation. Then, in between, there is also the group consensus that acts to decide adopting or not".

Thus, as Figure 2 suggests, there is a large number of alternate "paths" that organizational innovations may take.

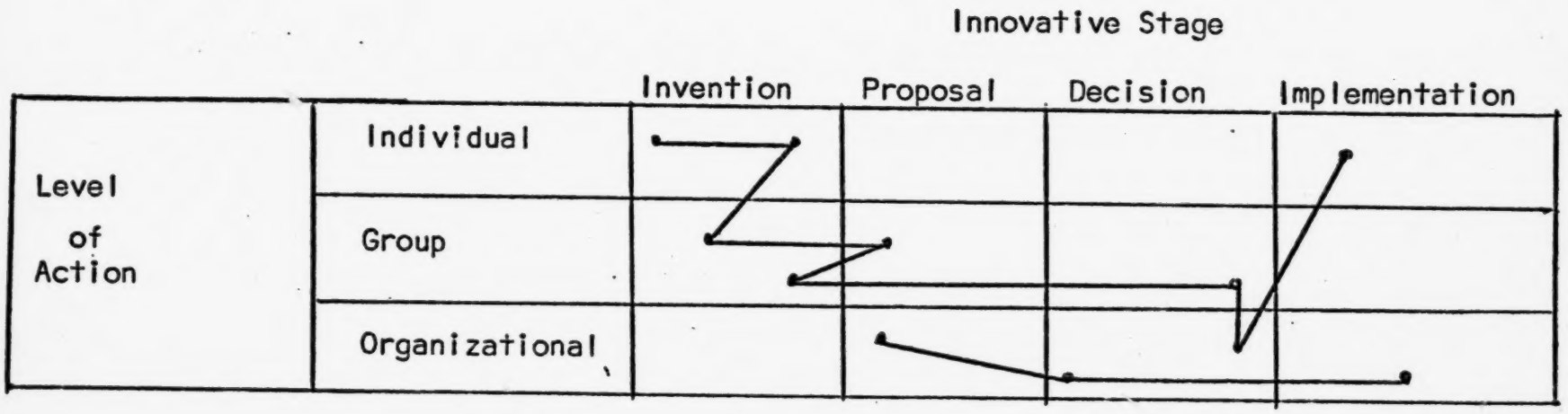
Even if we ignore the occurence of "rebounds" and the many cases in which invention occurs outside the focal organization, there are over eighty simple paths that innovations may follow. It is highly probable that there are

---

[8] The state of ignorance may be overstated here, but systematic research is still at the programmatic stage. See Clark (1968).

FIGURE 2.

INNOVATIVE PATHS



significant behavioral differences among innovations whose paths through the innovative stages differ in their levels of action (cf. March and Simon, 1958, pp. 194-99), and researchers may find it informative to do comparative studies of selected "ideal type" paths. Moreover, it may be equally useful to take account of intra-stage differences in action levels in explaining certain aspects of innovative behavior. For example, Rogers and Shoemaker (1968, pp. 19-22) suggest that a proposal requiring group decision would be judged more slowly than one requiring only individual judgment.

Other Descriptive Characteristics

Diffusion researchers, in particular, have devoted much attention to generating attributes to describe innovations "on the premise that the attributes of an innovation itself are a basic factor in explaining differences in the rates at

which various innovations are adopted" (Fliegal and Kivlin, 1966, p. 247).[9] An ever-mounting number of empirical verifications of the significant effects of various attributes on rates of adoption of specific innovations offers supportive testimony (e.g. Rogers, 1962, pp. 134-42; Fleigal and Kivlin, 1966). Lionberger (1963), for example, summarized the characteristics of innovations that influence acceptance rate as:

> "complexity, utility, initial cost, continuing cost, rate of cost recovery, compatibility, communicability, relative advantage, mechnaical attraction, saving of time, saving of discomfort, and divisibility. Varying degrees of support have been found for most of these factors with the cost being in greatest dispute and complexity, compatibility and relative advantage being best supported as important factors".

To date there have been few studies in organizational contexts of the independent influences of these characteristics on innovative behavior.[10] In any case, many contradictory generalizations about the role of most of such attributes may be found in the innovation literature (see Kushner et al, 1962). It has been argued that such generalizations are premature and, "that much detailed work remains to be done to determine which attributes are relevant under given circumstances" (Fliegal and Kivlin, 1966, p. 237).

In contrast to the "attribute proponents", Bhola (1965b, p.7) comments that:

> "A review of the literature in the area of innovation research and theory led us to the position that the characteristics of an innovation were not

---

[9] Rogers (1962, pp. 124-34) suggests five conceptually distinct characteristics of innovations to serve as basic variables in research on rates of adoption (relative advantage, compatability, complexity, divisibility, and communicability) and states that all other terms previously used to describe innovations may be subsumed under these five. Le Breton (1965, pp. 18-20, 61-83, 160-179) offers a set of seventeen dimensions to characterize the planning and implementation processes in organizations, which are also applicable to innovations in general.

[10] A number of relevant studies have been done on "compatability" and "profitability" in relation to the first (invention) and third (decision) stages of the innovation process. Most of these studies have dealt primarily with technological innovations and only by implication with organizational innovations. For rather dated summaries, see Nelson (1959) on invention and Rogers (1962, p. 136 ff.) on adoption.

> primary in determining the probability of the diffusion of an innovation.... If all the needed resources were available and deployed, the adoption of any innovation could be achieved ..."

He is, in effect, agreeing with Fliegal and Kivlin that diffusion research has tended to ignore contextual effects at the cost of confounding them with the possible independent influence of the innovation's attributes. Perhaps even more important, the predominant focus on the individual as the adopting unit has fostered great concern for the individual's perception of the innovation and inter-subjective attributes of innovations have not generally been distinguished from potential-adopter's opinions. It is less tautological to look at such perceptions as intervening variables. Students of organizational innovation have probably been quite wise to largely ignore such "characteristics" as independent variables.

Are there any inter-subjective attributes of innovations which would be useful for comparative studies of organizational innovation? The scope of an organizational innovation will be defined as the proportion of the organization's activities it is intended to encompass. Thus, an innovation which is designed primarily to restructure the control activities in a particular phase of a production process by introducing an automatic monitoring system and eliminating lower-level supervisory positions is less comprehensive than one intended to reorganize the control structure of an entire industrial corporation, with concomitant changes in many of the resource supply, production, and distribution activities by changing it from a highly centralized monolith into a number of semi-autonomous product divisions (e.g. Chandler, 1962). In this regard, one might also be inclined to distinguish policy innovations (changes in the identifying goals of the organization) from procedural innovations (which do not question the adequacy of existing goals), on the grounds

that either the goals are inherently more "important" for organizational functioning, or goal changes are necessarily accompanied by procedural changes of wide scope. Several case studies of policy innovation suggest otherwise (e.g. Zald and Denton, 1963).

To summarize, the innovative stage, locus of action, and the proportion of organizational activities encompassed are rudimentary dimensions on which it should be fairly straightforward to classify innovations occurring in various organizations. With reference to Wilson's (1966) relativistic position about the "significance" of organizational innovations, path and scope are characteristics which can facilitate the comparison of innovations across both time and space, reducing the researcher's reliance on his subject's responses and placing such responses in a more objective framework for theoretical development.

Measures of Innovativeness

Victor Thompson (1969, p. 65) has summarized the present condition of measurement of organizational innovativeness:

> "An operational definition of innovation has not yet been agreed upon, and measurement of this ... variable is in a chaotic state. Much of the best research has dealt with the problems of scientists and engineers in research, development, or engineering in bureaucratic organizations rather than the specific problem of organizational innovation. In fact, I have found very little of this kind of research, and that was almost always limited to (technological) innovation".

He concludes that "research in organizational innovation will have to make pragmatic use of whatever measurements are available in the context of the specific research project," and that, rather than attempting to construe more objective measures, "we should get on with the measurement of those organizational qualities which theory tells us are related to innovativeness" (p.69). In light of the confused understanding of "innovativeness", such prescriptions

seem a bit hasty!

Keeping the present organizational context and typology of organizational innovations in mind, we can look more systematically at some of the measures that could be used to study innovative behavior. The most basic measures are the speed and the frequency of innovating. Innovative speed refers to the time required for given innovations to go through the process, while innovative frequency concerns the number of innovations occurring within a given time. It is conceivable, for example, that one organization can generally innovate very quickly but seldom innovates, while another frequently innovates but is generally slow at processing innovations. While the two aspects of innovativeness may often be closely related, it is incorrect to imply the frequency of innovation from the speed of any particular innovation as numerous researchers have tended to do.

Two types of empirical studies predominate, both interested in the speed of organizational innovation: the case study, and diffusion research. While both types of research have been primarily focussed on the decision stage and either the organizational or group level of action (see Figure 2), they have viewed speed quite differently. Case studies on the history of a particular innovation in a particular organization have documented the time required to complete one or more respective stages in the intra-organizational process. In the second approach, a number of similar organizations and one or more specific innovations are selected, and the "diffusion rate" -- the relative time at which the respective organizations adopt the innovation -- is of interest. Again, the finding that an organization is a late adopter of one or several innovations, for example, is not sufficient grounds for equating late adoption with slow internal processing. Indeed, the converse may often be the case, as the innovation's benefits are demonstrated by earlier adopters.

responses, observation, etc.) could be viewed in this context. While inclusive summaries of innovations have been suggested previously (e.g. Hage, 1965, pp. 292-93), most researchers will undoubtedly continue to consider mainly innovations which are either deemed socially important in their value system or organizationally important by some set of participants. In any case, such an "innovation summary in activities framework" approach can facilitate cautious comparisons of innovativeness.

The "summaries" approach lends itself most easily to measuring innovative frequency. Diffusion profiles and internal processing speed can also be studied more carefully and empirically related to frequency by this approach. However, all measures except the simplest frequencies require considerably more detailed attention than is likely to be available for preliminary research. Figure 3 represents a data matrix for a number of the simplest frequency measures based on the present typology of innovations. The internal cells would be filled with the number of innovations of each scope and level of action which are processed through the respective stages within a given time period. Taking account of innovative paths would complicate this picture significantly. Our immediate interest will be in measures involving the bottom three rows of this matrix: namely, the total frequency of innovation in each stage, the proportion of innovations from one stage that are accepted at the next stage of the process, and the proportion of innovations of "high" scope in each stage. Given these basic measures of our dependent phenomena, we may proceed to consider possible determinants of organizational innovativeness.

FIGURE 3.

MEASURES OF INNOVATIVE FREQUENCY

LEVEL OF ACTION	SCOPE	INNOVATIVE STAGE: INVENTION	PROPOSAL	ADOPTION	IMPLEMENTATION
INDIVIDUAL	High				
	Low				
GROUP	High				
	Low				
ORGANIZATIONAL	High				
	Low				
ALL LEVELS	High	100	50	10	7
	Low	200	150	100	50
	Total	300	200	110	57

DETERMINANTS OF ORGANIZATIONAL INNOVATIVENESS

An extraordinarily large number of organizational and environmental attributes have been suggested as factors bringing about organizational innovation (cf. Litterer, 1965, p. 415). How are we to proceed? Studies of organizational change in general have rejected the notion that change can somehow be explained by simply enumerating and weighing many factors (Guest, 1962, pp. 149-51) and placed a growing emphasis on an "unfolding process" in which order of occurrence of factors and their interactions are significant (Arensberg and Tootell, 1957, p. 316; Smelser, 1967, p. 687). Similar tendencies are discernible in recent theorizing about organizational innovativeness (e.g. Bhola, 1965b; Hage, 1965; Wilson, 1966; Mohr, 1969). That is, a small set of possible factors is selected and a number of interrelated hypotheses suggested.

We have no rigorous criteria for the selection of our independent variables. However, in light of the large number of content variables that have been suggested as determinants in the literature on innovation, it is helpful to recognize that the present conceptual outline is restricted entirely to formal characteristics. As the above innovation theorists have recognized, general theories of organizational behavior require variables which are formal characteristics applicable across "types" of organizations and neither temporally nor culturally bound (see Hage, 1965, pp. 290-91). There have been several attempts to develop general taxonomies of the formal attributes of organizations (e.g. Pugh et al, 1963; Haas et al, 1966; Perrow, 1967). However valuable such efforts may ultimately be, they have not been very compelling to date. The present selection strategy has been quite ad hoc. Using our skeletal framework of organizational and environmental components to order variables, a search of the organizational literature has been made and a few of the formal attributes

judged most likely to be related to our measures of organizational innovativeness chosen. The variables chosen bear no claim to either inclusiveness or representative coverage of the factors which could possibly be causally related to innovativeness. While the present list may be slightly more comprehensive than previous attempts at delineating general factors related to organizational innovativeness, the main concern is with parsimonious explanation. This is a minimal set of variables with which I would presently begin empirical study. Whether universal propositions based on such sets of variables are confirmed, qualified, refuted, or ultimately discarded, the testing of propositions within this framework of variables is presumed to be more likely to result in cumulative understanding of organizational innovativeness than testing in the context of "less variables than are necessary."

UNIVERSAL DETERMINANTS AND INNOVATIVE FREQUENCY: ILLUSTRATIVE PROPOSITIONS

The propositions are stated in the form: "The greater the value of the independent variable, the greater (or less) the innovative frequency." These propositions will generally be assumed to be irreversible, sequential, contingent and substitutable.[12] More importantly, they should be treated as stochastic. These are relationships which are mediate by more immediate, content factors, and we will not be able to make any statements to the effect that, under a specified value of any universal determinants, given organizations will definitely respond in a particular way. Rather we may concur with Wilson's (1968, p. 198) observation: "All that can be said is that various circumstances increase or decrease the probability of innovation." Moreover, it may be expected that when some of

---

[12] See Zetterberg (1965, p. 15 ff.) and Barton (1966, pp. 134-35) for discussion of the attributes of propositional relationships.

these determinants assume their more extreme values, the propositions will no longer hold.[13]

Only zero-order relationships are discussed here. The rationale for this is that the illustrative propositions are posited to be statistically significant in all types of organizations. Especially in view of the lack of empirical research dealing with innovative frequency as it is construed here, the testing of such simple relationships is a necessary basis for studying more complex conditionals. The following illustrative propositions will be ordered by the contextual component with which the independent variables are predominantly identified (see Figure 4).

Organizational Determinants

1. Resource Supply Factors

(1) The greater the proportion of unprogrammed actual resources (i.e. "resource slack"), the greater the frequency of proposal and adoption of innovations.

The "Gresham's Law" of planning (March and Simon, 1958, p. 185) predicts that organizational members will usually choose highly programmed over highly unprogrammed tasks. The greater the proportion of human resources utilized in existing routine tasks, the greater the propensity to attend to these tasks and their completion "deadlines" (e.g. Gaus and Wolcott, 1940, p. 68) and the less time remaining for innovative activity. March and Simon (1958, pp. 186-87) state that, "if all the resources of an organization are busily employed in

---

[13] "One might reasonably assume curvilinear relationships in such cases. We proceed here on the assumption that the extreme values of these determinants are insignificant, but as Hage (1966, p. 307) notes regarding the limits of universal propositions in organizational theory: "The determination of the actual limits requires a considerable amount of research..."

FIGURE 4.

DETERMINANTS OF INNOVATIVE FREQUENCY

ORGANIZATIONAL DETERMINANTS

RESOURCE SUPPLY	PRODUCTION-DISTRIBUTION	GOAL-SETTING	CONTROL
(1) resource slack	(4) processing integration	(6) goal diffuseness	(7) centralization
(2) personnel growth rate	(5) task complexity		
(3) % boundary-spanners			

ENVIRONMENTAL DETERMINANTS

RESOURCE DOMAIN	COMPETITORS	REGULATORS	RECEIVER DOMAIN
(8) resource dependency			(9) market uncertainty

carrying on existing programs, the process of initiating new programs will be slow and halting at best." But, even if material and natural resources are being underutilized by these programs, when most actual human resources are devoted to routine tasks the development of innovative strategies will still be slow. The frequency of innovation will tend to be lowest when there are actual shortages of available qualified personnel, for in such cases time pressures to complete routine duties will be strongest.

Organizations may attempt to stimulate the development of innovations by allocating specific personnel and other resources to unprogrammed activities such as research and planning units. One of the reasons that many large firms are more innovative than their smaller competitors appears to be that, partially through economies of scale, they are able to allocate a greater proportion of their personnel (and financial resources) to research and development activities (see NSF, 1956, 1959). Although <u>amount</u> of resources allocated to unprogrammed activities may also be correlated with innovativeness (e.g. Mansfield, 1962b) large absolute allocations may produce comparatively few innovative results in larger organizations, and the present proposition is suggested as a more universal relationship.

Of course, organizations with a large proportion of their financial resources unprogrammed may choose various non-innovative courses of action with surpluses, and many noneconomic factors will usually bear directly on such choices. It does seem reasonable to assume that the larger the surplus, potential "risk capital," the less constraining most varieties of sunk costs will be for innovative behavior. But the research evidence regarding this proposition is very weak.

In a distantly related study of the response rate of heavy industries to technological innovations, Mansfield (1963c, p. 310) concluded that a firm's financial "health" -- including its profitability and liquidity -- bears no close relationship to how long it waits before innovating. Mack (1941, p. 289), on the other hand, found indications that "progressive" machine manufacturing companies were generally in a strong financial position. As a more recent case illustration, consider the innovative activities of the Pennsylvania Railroad in the two years prior to its recent merger with the New York Central. From its sales of the Long Island, Norfolk and Western and Wabash lines it realized five hundred million dollars and rapidly began making a large number of organizational innovations by diversifying into pipelines, real estate, and chartered airlines. As President Stuart Saunders observes, the organization is "in a rather unique position to pursue diversification" (Time, January 26, 1968).

(2) The greater the rate of internal growth of the organization, the greater the frequency of innovations in all stages.

The most basic manifestation of organizational growth is increase in size. We will consider size here in terms of the number of personnel and the amounts of time they devote to the organization (cf. Boulding, 1953). As bodies increase in size they also tend to require changes in form in order to support themselves. In biology it has been firmly established that as organisms double in size and triple in volume, i.e. the "square-cube" law, the form of organism must also change in order to support the greatly increased weight. A similar relationship between size and supporting form appears to hold in organizations. Numerous observers have claimed that as an organization grows it is impossible to maintain the proportional structure of the organization intact (e.g. Boulding, 1953). Evidence is available, for example, that

increases in size are associated with various changes in the structural form of the managerial function (see Litterer, 1965, pp. 403-11). As Chandler (1966, p. 349) points out in his case studies of four large American corporations:

> "By forcing the reorientation of existing resources and the accumulation of more and often quite different types of personnel and facilities, growth brought new problems and new demands at every administrative level. Such needs required the planning and replanning of the design used to administer the resources, old and new, available to the enterprise.

But the point to be emphasized here is that increases in organizational size are related to numerous changes in structural combinations of activities. If this growth is slow it is more likely that the related structural changes will also evolve in a slow and unheralded manner, i.e. "organizational drift." But when organizational growth is rapid, the discretionary units will be more compelled to innovate in face of the more immediate inadequacy of the existing activity structures. Unfortunately, there are no existing studies relating the present conception of organizational growth rate (i.e. rate of increase in number of members and amount of time devoted to the particular organization) to the frequency of innovation. It is interesting to note that several existing studies dealing with specific procedural innovations and rates of growth of organizational output have not discovered significant correlations (Phillips, 1956, pp. 184-192; Mansfield, 1963c, pp. 302-304, 310). One may argue that using increases in output as measures of organizational growth may confound the overutilization of present resources (which implies the previously discussed routinization of activities proposition) with actual increases in the size of the organization "corpus."

It should <u>not</u> be inferred from the preceding argument that the larger the organization is, the more innovative it will be. Since Schumpeter,

numerous economic theorists have argued strongly for this proposition (e.g. Galbraith, 1952, p. 91; Kaplan, 1954) and many recent studies of business and industry support their arguments (see Phillips, 1956; Mansfield, 1963b, 1963c). But there are also a wealth of arguments in the Weberian tradition supporting the converse relationship. For example, Downs (1966, p. 106) has recently presented a convincing theory of bureaucratic decision-making in which he concludes that smaller organizations tend to be more flexible and innovative than larger ones. Similarly, after a number of case studies of technological innovation, Maclaurin (1950, p. 110) comments that:

> "Any large, well-established institution almost inevitably tends to become somewhat bureaucratic. It develops fields of special interest; and no matter how hard it tries to be receptive to new ideas, the radical notion and the new risk-taking approach are not always exploited."

The contradictory evidence suggests that the factor of absolute organizational size has a varying effect on innovative behavior and consequently may be more usefully studied by controlling for more universal factors.

(3) The greater the proportion of boundary-spanning personnel, the greater the frequency of innovations in all stages. [14]

Boundary-spanning personnel are those who utilize extra-organizational referents in their work. Obviously, this will include many of those involved in resource supply and distribution activities, and particularly, externally-trained "professionals". There is an uncommonly large amount of research evidence lending support to this proposition. For example, in a comparative

---

[14] It should be noted that cross-sectional empirical studies indicate that as an organization increases in size, the proportion of "boundary-spanning" positions to "internal" positions approximates a square root-cube root relationship (Hare, 1959; Levy and Donhowe, 1962).

study of selected American industries from 1947 to 1955, Hill and Harbison (1959, p. 55) found that both technological and organizational innovations were generally associated with increases in proportion of professional personnel and conversely that, "Companies that grew in size but did not innovate tended to employ a constant or declining percentage of their work force in executive, professional and related occupations." Stinchcombe (1960) showed, in a secondary analysis of this data, that the most innovative firms also began this period with more professionals than other companies, and also found that "progressive" firms generally have more professionals in their dominant coalitions. Browning (1963) observed that, of two state government departments he studied, the one with more professionals participated in far more boundary-spanning activities and was much more innovative. With regard to external "training", Carlson (1962) in studies of executive succession among school superintendents found that externally recruited successors were likely to propose more innovations than those who were internally promoted. Similarly, Rice (1963, p. 213) in discussing the problems of promotion and competent leadership notes that:

> " 'Learning the hard way' is a traditional method of breeding leaders in the industry of the United Kingdom, but by the time they reach the top they are usually imbued with a tradition and a way of believing that in themselves inhibit their bringing about adequate adaptation to changes either in the environment or in the enterprise."

Externally trained professionals are less likely to accept conventional structures as unshakeable.[15] They usually take a wider perspective regarding the organization than do other members, both because their training has provided them with a larger base of <u>relevant</u> ideas and expert knowledge on which to build

---

[15] Of course, the longer they remain in an organization the less they may be considered "externally trained" and the more imbued with traditions. Length of time spent in the organization should be included in future studies of the relation of "professionalism" to organizational innovation.

and because they are more likely to have contact with external, work-related associations with contrasting views. More generally, Barnett (1953, p. 83) suggests that, "Individuals with narrow ranges of experience and little training in objective thinking have only a limited number of responses to any given situation at their command." In non-professional organizations the characteristics of wide external experience and training may be tapped by measures of "cosmopolitanism", and this variable is usually associated with high rates of adoption of innovations (see Rogers, 1962).

2. Production-Distribution Factors

(4) The more loosely integrated work activities are, the greater the proportion of low-scope innovations which are adopted and implemented.

Geertz (1963, p. 68), in analyzing the Javanese bean-curd industry, notes that the productive process is divisible into small, more or less separate and only loosely integrated parts and that this permits extreme flexibility in organization. In general, the less the operational necessity for an unique sequential or spatial order and a rigid processing time, the easier will be the recombination of work activities. When production activities are loosely integrated, decision units may wish to try a number of different production combinations to determine which are the most effective and efficient. Whatever the motivation of the decision units, large numbers of low-scope proposals may be adopted without physical difficulties. With regard to the implementing production units, the fact that they are loosely integrated (i.e. low interdependence) suggests both that most social interaction will be within units and that various combinations of units may require similar amounts of work. Under such social and work conditions, acceptance of new low-scope combinations should be maximal. In this regard, it is interesting to contrast the bean-curd technology with that

of more modern industries. As Thompson (1969, p. 40) observes:

> "Automation ties many smaller operations into one large one so that installation, de-bugging, shutdown, and repair costs are much higher. It introduces increasing inflexibility into industrial operations, forcing dependence on an increasingly stable environment in regard to technology, markets, materials, and work force skills."

(5a) The greater the complexity of the organization's activity structure, the greater the frequency of invention and proposal of innovations.

(5b) The greater the complexity of the organization's activity structure, the lower the proportion of proposals adopted and implemented.

Wilson's (1966, pp. 198-204) central argument has provided the basis for these propositions. The complexity of the organization's activity structure increases as the number of different active, organizationally defined tasks and the number of nonroutine tasks increases. Increases in task complexity may be distributed quite unevenly among the members. For example, a janitor may continue to perform only one active task such as the maintenance service of sweeping the plant floor and be the passive observer or recipient of other goal-setting, control, resource supply, production and distribution tasks, while a higher level manager accumulates new nonroutine tasks and concurrently increases the complexity of his immediate subordinates' "task clusters" by delegating them partial active responsibilities for some of his prior, more routine tasks.

Wilson (1966, pp. 200-201) argues that:

> "A highly complex task structure inhibits close supervision, the precise specification of operations, and the linking of tasks in some mechanical fashion. Either ends or means will be vaguely specified.... There will be few standards the organization can use to maintain conformity among members .... This complexity means that activity anywhere in the organization will probably affect its members differentially."

Under conditions of task complexity then, the inhabitants of the more vaguely defined positions will have to conceive much of the form of their "destructuralized microcosms" among themselves (cf. Barnett, 1953, pp. 71-74).[16] Thus, with greater task complexity, a greater diversity of conceptions of structural combinations of organizational activities will result. Similarly, the greater the diversity of the organization, the more likely it is that any particular innovative conception will find enough support to be developed into a proposal.

While complexity of the activity structure generally stimulates invention and proposal of organizational innovations, it also acts as a barrier to their adoption and legitimation. Under conditions of complexity both policies and procedures are harder to specify at the organizational level. Hence, top level decision-makers must increasingly rely on members at lower levels, nearer both actual domains and operational procedures, to provide the details necessary for deciding on change proposals. In this manner, the effective dominant coalition becomes both larger and more conflict-ridden. As Wilson (1966, p. 203) explains executive behavior in the innovation decision process:

> "The more complex the task structure, the less likely it is that the executive will be sufficiently knowledgable about members' work to run the risk of instituting an innovation without obtaining their consent. Only to the degree that he understands the organization's technology can he innovate entirely on his own authority; lacking this understanding, he must rely to some significant extent on the opinions of subordinates (who are thus effectively members of the dominant coalition) as to the feasibility, costs, and benefits of the proposed change. But a complex task structure also means that many (coalition) members will be affected

---

[16] This statement is not intended to imply that under conditions of complexity most changes will be of small scope. Numerous positions of authority may, within their "microcosms," require the interpretive structuring of a wide span of subordinate activities.

> differentially by any major change; this in turn increases the probability that there will be a disagreement among (coalition) members about the merits of the change."

Finally, if the effective dominant coalition achieves a large enough consensus within itself to decide to adopt a given proposal, the innovation still must be legitimated by the implementing unit. As the quoted argument implies, the more complex the task structure the more difficult this stage will be as well. Unless the dominant coalition is identical with the implementing unit, one would expect diversity at this lower level -- even in face of a dominant coalition armed with strong incentives and threats -- to at least delay the legitimation of the adopted proposal. Therefore, the greater diversity of opinion occurring in complex activity structures will likely result in a higher propostion of rejections of innovations, and a more difficult time for any particular innovation. Nevertheless, it is possible that, in a significant number of organizations, the much greater rate of invention and proposal may result in a greater <u>frequency</u> of adoption and legitimation than in organizations with simple task structures.

3. Goal-Setting

> (6) The more diffuse organizational goals are, the greater the frequency of innovation in all stages.

The extent to which consensus on intended domains is achieved by the dominant coalition, among themselves and vis à vis influentials in the task environment, will greatly influence both the clarity with which the organization's identifying goals are understood by the membership, and the operationality of goals, i.e. the extent to which it is possible to observe and test how well goals are being achieved (March and Simon, 1958, p. 42). If there is a low degree of consensus on existing organizational goals, goals will be diffuse and there will be a low degree of organizational commitment to existing activity structures. With intended domains so unrigidly defined and vaguely adhered to,

it becomes more probable that discretionary units will both conceive inventions to diminish uncertainty and give greater attention to such proposals, and that implementing units will be willing to legitimate them. In relevant case studies, Zald and Denton (1963) found that the existing broad, diffuse goals of the Y.M.C.A. were an important determinant of the organization's ability to change intended domains while Messinger (1955) suggested that the precise goals of the Townsend Movement inhibited its ability to innovate. Similarly, Clark (1956a, 1956b) found that adult education centers in California were characterized by high rates of program innovation because the dominant member coalitions had only vague conceptions of organizational goals and therefore were highly vulnerable to the preferences of their client-recipients. In one of the few comparative studies bearing on the relationship between diffuseness of goals and innovative behavior, Burns and Stalker (1961) concluded that those firms with ambiguous intended domains were notably more innovative than firms with high consensus, precise ones. In fact, in some of the most highly innovative electronics firms, top managers deliberately obscured the operationality of all goals related to specific domains in order to stimulate innovative behavior (Burns and Stalker, 1961, pp. 92-93 and passim).

4. Control Factors

(7) The greater the centralization of control, the lower the frequency of innovation at all stages.

Organizational control structures may be based predominantly on either restrictive or enabling philosophies of management (Kappler, 1960). Restrictive management structures are characterized by explicit, centrally formulated plans and standards which are intended to serve as guiding criteria for most relevant directive, evaluative, motivating and information supply activities. Enabling control

structures are less formalized, delegate significant discretionary judgment to lower level control positions, and emphasize co-ordination by feedback. Generally, the more restrictive the control structure, the less sensitive the feedback mechanisms of the higher level discretionary units are to deviations from the formal plan experienced in lower level operational activities. Upward information flow, often mediated through lower level routinized control positions, tends to reinforce the existing plan, and the probability of lower level inventions occurring and proposals reaching effective decision-making units is small. By the same token, as these decision-making units receive less information regarding operational discrepancies and -- because there are less of them and their larger feedback channels are more frequently overloaded -- also receive a lower total amount of usable information regarding operational issues than enabling control structures do, there is less likelihood of inventions or proposals of innovations being initiated by effective discretionary units themselves (cf. March and Simon, 1958, pp. 197-8).

Evidence supporting this proposition is fairly plentiful. For example, in studies of twenty British firms, most of them involved in electronics development, Burns and Stalker (1961) observed that firms with enabling philosophies of control ("organic" management systems) exhibited a much greater flexibility in their activity structures and a higher frequency of both policy and procedural innovations than restrictive firms ("mechanistic" management systems) which were more rigidly attuned to conditions of stability.[17] Guest's (1962) case study of an automobile plant suggests that a large number of procedural innovations (as well as dramatic increases in productivity)

---

[17] See Boulding (1953) and Bendix (1956) for more general analysis of the results of restrictive and enabling management ideologies.

were directly the result of change from restrictive to enabling management control.

Environmental Determinants

1. Resource Domain

(8) The greater the concentration of available input financial resources, the greater the proportion of high-scope proposals which are adopted.

Of the potential supply agencies of financial resources in a given organization's task environment, it may depend directly on a few or on many. Evan (1966, pp. 180-81) hypothesizes that organizations which depend on a relatively small number of supply agencies have a low degree of autonomy in decision-making. He contrasts the case of the public university which usually has few sources of capital, most notably state and federal legislatures, with that of a private university. One might expect that private universities would find it easier to manipulate the structure of their more diverse intended input domains, and would be less constrained as well by the reaction of any particular supplying agency in either altering their recipient domains or adopting major procedural innovations. The concentration of other types of input resources may effect the frequency of policy innovations in the same way, but the concentration of financial inputs is presumed to generally have the most noticeable effect on policy determination. There has been little careful study of this variable.

2. Receiver Domain

(9) The greater the rate of change in market conditions, the greater the frequency of innovations in all stages.

Whether the population served consists of consumers of material products or clients receiving services it may be said to exhibit a "market" structure by the pattern in which it absorbs the relevant output. If an organization

experiences a change in the demand for its output which is either above or below its expectations (as distinct from acceptable limits) it will be stimulated both to change its present operating procedures and to search for new products and markets. This is clear in the case of dwindling demand. As Burns and Stalker (1961, p. 70) observed in one of their comparative studies, "In every case, the primary factor in the firm's decision to explore new technical ground in order to derive new products was the shrinkage or closure of the market for its existing products." The reference was to Scottish firms imminently concerned with their survival, but a similar effect can be observed in highly viable organizations when demand falls below their programmed expectations.

In the case of demand consistently increasing, this proposition may be merely a special application of the more general growth effect. Nevertheless, the faster the rate of increase in demand, the more likely it is to be increasing beyond the organization's programmed expectations, and particularly in widely fluctuating markets where predicting demand is most difficult, discretionary judgment will be required and innovative behavior will be most likely to occur both in order to achieve better ways of coping with this market and to diversify or convert to more satisfactory markets. Bonini's (1963, p. 135) simulation studies of the variability of the organization's (market) environment support this view:

> "Firms existing in a relatively stable environment may be sluggish in adjusting to new conditions, in taking advantage of market opportunities, and in introducing new technology. On the other hand, firms which live in a constantly fluctuating world may be quicker to sense and seize opportunities."

PROSPECTUS

The effort devoted to systematic theorizing about organizational innovativeness in recent years (e.g. Bhola, 1965b; Hage, 1965; Wilson, 1966) is a very optimistic sign, and there have been several attempts to empirically test interrelated sets of propositions about organizational innovativeness (e.g. Hage and Aiken, 1967; Mohr, 1969). However, these studies still tend to ignore most of conceptual difficulties that I have attempted to clarify in this paper. We are building our castles in the sand.

Whether the present conceptual outline is judged of heuristic value or not, I would maintain steadfastly that the "summaries approach" to innovativeness is indispensible to the verification of general propositions. If so, empirical studies with a radically different focus than the organizational innovation research now available are required. Many of these studies could be carried out with little cost. First, rather than selecting specific innovations and relating them to various numbers of factors construed as specific, immediate causes, some intensive studies of effective organizational level discretionary units could be made in various types of organizations in order to more generally gauge innovative behavior. In many types of organizations, records of the innovative behavior of such units over long time periods are fairly accessible and may provide good indications of the frequency of various stages of innovation, the proportions of different types of innovations, as well as the speed of innovative process. Similarly, adequate historical evidence is available in various organizations regarding proposed universal determinants. Such records are a rich and largely untapped source of data for the longitudinal,

cross-organizational study of innovative behavior.[18]

It should be relatively easy to test the universality of propositions such as those suggested here, by the study of widely different types of organizations. Rather, it should be easy to establish which propositions do not hold in all types of organizations. The process of elimination could occur quite rapidly if even a small portion of future efforts in the field of organizational innovation were directed at this general comparative level. At any rate, the testing of such sets of universal propositions, as well as their even more important qualification, promises to provide the integrating perspectives and cumulative development, both within and between specific types of organizations, that this field has previously lacked. Hopefully, the present outline has suggested some worthwhile conceptual strategies toward this realization.

---

[18] Chandler's (1966) case studies are the best existing illustration of the potential of this research strategy.

REFERENCES

Arensberg, C. M. and G. Tootell. "Plant Sociology: Real Dimensions and New Problems," in M. Komarovsky (ed.), Common Frontiers of the Social Sciences. Glencoe, Illinois, Free Press, 1957.

Bakke, E. W. "Concept of the Social Organization," in M. Haire (ed.), Modern Organizational Theory, New York: Wiley, 1959, 16-75.

Barnett, H. G. Innovation: The Basis of Cultural Change, New York: McGraw-Hill, 1953.

Barton, A. "Comments on Hage's 'An Axiomatic Theory of Organizations'," ASQ, 11 (1966), 134-39.

Barton, A. H. and B. Anderson. "Change in an Organizational System: Formalization of a Qualitative Study," in A. Etzioni (ed.), Complex Organizations, New York: Holt, Rinehart and Winston, 1961, 400-18.

Ben-David, J. "Roles and Innovations in Medicine," AJS 65 (1960), 557-68.

Bennis, W. G., Benne, K. D. and Chin, R. The Planning of Change: Readings in the Applied Behavioral Sciences, New York: Holt, Rinehart and Winston, 1961.

Bhola, H.S. Innovation Research and Theory, Columbus: School of Education, Ohio State University, 1965a.

_____ The Configurational Theory of Innovation Diffusion. Columbus: School of Education, Ohio State University, 1965b.

Boguslaw, R. The New Ut opians: A Study of System Design and Social Change, Englewood Cliffs, New Jersey: Prentice-Hall, 1963.

Bonini, C. P. Simulation of Information and Decision Systems in the Firm. Englewood Cliffs, New Jersey: Prentice-Hall, 1963.

Boulding, K. The Organizational Revolution, New York: Harper and Row, 1953.

Browning, R. P. "Innovative and Non-Innovative Decision Process in Government Budgeting," Paper read at annual meeting of A.P.S.A., New York, 1963.

Burns, T., and G. M. Stalker. The Management of Innovation , London: Tavistock Publications, 1961.

Caplow, T. Principles of Organization, New York: Harcourt, Brace and World, 1964.

Carlson, R. O. Executive Succession and Organizational Change, Chicago: Midwest Administration Centre, 1962.

Carlson, R. O. and others. Change Processes in the Public Schools, Eugene: Center for the Advanced Study of Educational Administration, University of Oregon, 1965a.

Carlson, R. O. Adoption of Educational Innovations, Eugene: Center for the Advanced Study of Educational Administration, University of Oregon, 1965b.

Carter, C. F. and B. R. Williams. "The Characteristics of Technically Progressive Firms," Journal of Industrial Economics, 7 (1959), 87-104.

Chandler, A. D., Jr. Strategy and Structure, Garden City, New York: Doubleday Anchor, 1966.

Clark, B. R. Adult Education in Transition: A Study of Institutional Insecurity, Berkeley and Los Angeles: University of California Press, 1956.

Clark P. B. and J. Q. Wilson. "Incentive Systems: A Theory of Organization," ASQ, 6 (1961), 129-66.

Coleman, J. S., E. Katz and H. Menzel. Medical Innovation: A Diffusion Study, Indianapolis: Bobbs-Merrill, 1966.

Colliver, A. "Bibliography on the Interrelations of Organizations," Stony Brook, New York: State University of New York, August, 1967. (mimeo)

Couch, C. J. Communication and Change, East Lansing: Institute for Extension Personnel Development, Michigan State University, 1964.

Cyert, R. M. and J. G. March. A Behavioral Theory of the Firm, Englewood Cliffs, New Jersey: Prentice-Hall, 1963.

Dale, E. Planning and Developing the Company Organization Structure, New York: American Management Association, 1952.

Dill, W. R. "Environment as an Influence on Managerial Autonomy," ASQ, 2 (1958), 409-43.

_____ "The Impact of Environment on Organizational Development," in S. Mallick and E. H. Van Ness (eds.), Concepts and Issues in Administrative Behavior, Englewood Cliffs, New Jersey: Prentice-Hall, 1962, 94-109.

Downs, A. Bureaucratic Structure and Decisionmaking, Santa Monica: RAND Corporation, 1966 (RM-4646-1-PR).

Dyer, F. C. and J. M. Dyer. Bureaucracy vs. Creativity, Coral Gables, Florida: University of Miami Press, 1965 (Publications in Business and Edonomics, #9).

Emery, F. E. and E. L. Trist. "The Causal Texture of Organizational Environments," Human Relations, 18 (February 1965), 21-32.

Etizioni, A. A Comparative Analysis of Complex Organizations, New York: Free Press, 1961.

Evan, W. M. "The Organization-Set: Toward a Theory of Interorganizational Relations," in J. D. Thompson (ed.), Approaches to Organizational Design, Pittsburgh: University of Pittsburgh Press, 1966, 173-192.

Galbraith, J. American Capitalism, Boston: Houghton-Mifflin, 1952.

Gaus, J. M. and L. O. Walcott. Public Adminstration in the US Department of Agriculture, Chicago, 1940.

Geertz, C. Peddlars and Princes, Chicago: University of Chicago Press, 1963.

Gilfillan, S. C. The Sociology of Invention,Chicago: Follet, 1935.

Ginzberg, E., and Reilley, E. W. Effecting Change in Large Organizations, New York, Columbia University Press, 1957.

Guest, R. H. Organizational Change: The Effect of Successful Leadership, Homewood, Illinois: R. D. Irwin, Inc., 1962.

Haas, J. E., R. H. Hall, and N. J. Johnson. "Toward an Empirically Derived Taxonomy of Organizations," in R. V. Bowers (ed.), Studies on Behavior in Organizations, Athens: U. of Georgia Press, 1966.

Hage, J. "An Axiomatic Theory of Organizations," ASQ, 11 (1966) 289-320.

Hage, J. and M. Aiken. "Program Change and Organizational Properties: A Comparative Analysis," AJS 72, 5 (1967) 503-19.

Hagen, E. E. On the Theory of Social Change, Homewood, Illinois: Dorsey, 1962.

Haire, M. "Biological Models and Empirical Histories of the Growth of Organizations," in M. Harie (ed.), Modern Organization Theory, New York: Wiley, 1959, 272-306.

Hill, S. E. and F. Harbison. Manpower and Innovation in American Industry, Princeton: Princeton University Press, 1959.

Jewkes, J., Sawers, D. and Stillerman, R. The Sources of Invention, London: Macmillan, 1958.

Kaplan, A. Big Enterprise in a Competitive System, Washington, D.C.: Brookings Institute, 1954.

Kappler, M. O. "The Opportunity for Innovation in Management Controls," in D. G. Malcolm et al (eds.), Management Control Systems, New York: Wiley, 1960.

Katz, D. and R. L. Kahn. "Organizational Change," in The Social Psychology of Organizations, New York: Wiley, 1966, 390-451.

Katz, E. "Notes on the Unit of Adoption in Diffusion Research," Sociological Inquiry, 32 (1963), 237-53.

Kushner, G., M. Gibson, J. Gubick, J. J. Honigman, and R. Nonas. What Accounts for Sociocultural Change? A Propositional Inventory Chapel Hill, N.C.: Institute for Research in Social Science, U. of North Carolina, 1962.

Lawrence, P. R. The Changing of Organizational Behavior Patterns: A Case Study of Decentralization, Boston, Massachusetts: Harvard University, Graduate School of Business Administration, Division of Research, 1958.

Leavitt, H. J. "Applied Organizational Change in Industry: Structural, Technological and Humanistic Approaches," in J. G. March (ed.), Handbook of Organizations, Chicago, Rand McNally, 1965, 1144-1170.

Le Breton, P. P. General Administration: Planning and Implementation, New York: Holt, Rinehart and Winston, 1965.

Levine, S. and P. E. White. "Exchange as a Conceptual Framework for the Study of Interorganizational Relationships," ASQ, 5 (March 1961) 585-601.

Levy, S. and G. Donhowe. "Exploration of a Biological Model of Industrial Organization," Journal of Business, 35, 4 (October 1962), 335-42.

Lin, N. "Note on a Typological Analysis of the Decision-Making Processes of Innovation Assimilation," unpublished manuscript, Center for Research in Scientific Communication, The Johns Hopkins University, March, 1967.

Lionberger, H. F. Adoption of New Ideas and Practices, Ames: Iowa State University Press, 1960.

Litterer, J.A. The Analysis of Organizations, New York: Wiley, 1965a.

Maclaurin, W. R. "The Process of Technological Innovation: The Launching of a New Scientific Industry," American Economic Review, 40 (1950), 90-112.

McNulty, J. E. "Organizational Change in Growing Enterprises," ASQ, 7 (1962), 1-21.

Mack, R. The Flow of Business Funds and Consumer Purchasing Power, New York: Columbia University Press, 1941.

Malinowski, B. "Man's Culture and Man's Behavior," Sigma XI Quarterly, 30, 1 (1943).

Mann, F. C. and L. K. Williams. "Observations on the Dynamics of a Change to Electronic Data-Processing Equipment," ASQ, 5 (1960), 217-56.

Mansfield, E. "The Expenditures of the Firm on Research and Development," Cowles Foundation Discussion Paper #136, New Haven: Yale University, 1962b.

_____ "Intrafirm Rates of Diffusion of an Innovation," Review of Economics and Statistics, 45 (1963a), 348-59.

_____ "Size of Firms, Market Structure, and Innovation," Journal of Political Economy (1963b).

_____ "The Speed of Response of Firms to New Techniques," Quarterly Journal of Economics, 77 (1963c), 290-311.

March, J. G. and H. A. Simon. Organizations, New York: Wiley, 1958.

Messinger, S. L. "Organizational Transformation: A Case Study of a Declining Social Movement," ASR, 20 (1955), 3-10.

Miles, M. B. (ed.). Innovation in Education, New York; Bureau of Publications, Teachers College, Columbia University, 1964.

Mohr, L. B. "Determinants of Innovation in Organizations," APSR 63, 1 (1969) 111-26.

Moore, W. E. "A Reconsideration of Theories of Social Change," ASR, 25, (1960), 810-16.

NSF. Science and Engineering in American Industry, Washington, D.C.: National Science Foundation, 1956.

_____ Funds for Research and Development in Industry, Washington, D.C.: National Science Foundation, 1959.

Nelson, R. R. "The Economcis of Invention: A Survey of the Literature," Journal of Business, 32 (1959), 101-27.

Parsons, T. "Some Ingredients of a General Theory of Formal Organization," in Structure and Process in Modern Societies, Glencoe, Illinois: Free Press, 1960, 57-96.

_____ "Suggestions for a Sociological Theory of Organizations, I, II," ASQ, 1 (1956), 63-85 and 225-39.

Perrow, C. "The Analysis of Goals in Complex Organizations," ASR, 26 (1961), 854-66.

_____ "A Framework for the Comparative Analysis of Organizations," ASR 32 (1967), 194-208.

Phillips, A. "Concentration, Scale, and Technological Change in Selected Manufacturing Industries, 1899-1936," Journal of Industrial Economics, 4 (1956), 179-93.

Pugh, D. S. "Modern Organization Theory: A Psychological and Sociological Study," Psychological Bulletin, 66, 4 (1966), 235-51.

Pugh, D. S., D. J. Hickson, C. R. Hinings, K. M. Macdonald, C. Turner and T. Lupton. "A Conceptual Scheme for Organizational Analysis," ASQ, 6 (1963) 289-315.

Redlich, F. "Innovation in Business," American Journal of Economics and Sociology, 10 (1951), 285-91.

Rice, A. K. The Enterprise and its Environment: A System Theory of Management Organization, London: Levistock Publications, 1963.

Rogers, E.M. Toward a New Model for Educational Change, Paper presented at Conference on Strategies for Educational Change, Washington, D.C., November 8-9, 1965.

Rogers, E. M. and F. F. Shoemaker. Diffusion of Innovations: A Cross Cultural and Communication Approach, New York: Free Press of Glencoe, in press.

Rossman, M. J. The Psychology of the Inventor, Washington, D.C.: Inventors Publishing Company, 1931.

Saunders, B. S. "The Course of Invention," Journal of the Patent Office Society (October 1936).

Sayles, L. R. "Changes Processes in Organizations: An Applied Anthropo logical Analysis," Human Organization, 21 2 (1962), 62-67.

Scott, W. H. and others. Technical Change and Industrial Relations: A Study of the Relations Between Technical Change and Social Structure in a Large Steel Works, Liverpool: Liverpool University Press, 1956.

Simpson, R. L. and W. H. Gulley. "Goals, Environmental Pressures, and Organizational Characteristics," ASR, 27, 3 (June 1962).

Smelser, N. "Processes of Social Change," in N. Smelser (ed.), Sociology: An Introduction, New York: Wiley, 1967, 671-728.

Starbuck, W. "Organizational Growth and Development," in J. G. March(ed.) Handbook of Organizations, Chicago: Rand McNally, 1965.

Stinchcombe, A. L. "The Sociology of Organization and the Theory of the Firm," Pacific Sociological Review, 3, 2 (1960), 75-82.

_____ "Social Structure and Organizations," in J. G. March (ed.) Handbook of Organizations, Chicago: Rand McNally, 1965, 142-93.

_____ "Formal Organizations," in N. Smelser (ed.) Sociology: An Introduction, New York: Wiley, 1967, 151-202.

Stogdill, R. M. "Dimensions of Organization Theory," in J. D. Thompson (ed.), Approaches to Organizational Design, Pittsburgh: University of Pittsburgh Press, 1966.

Thompson, J. D. Organizations in Action: Social Science Bases of Administrative Theory, New York: McGraw-Hill, 1967.

Thompson, J. D. and W. J. McEwen. "Organizational Goals and Environment: Goal Setting as an Interaction Process," ASR, 23 (1958), 23-31.

Thompson, V. A. Bureaucracy and Innovation; University: University of Alabama Press, 1969.

Zald, M. N. and P. Denton. "The YMCA: From Evangelism to General Service", ASQ 8 (1963) 214-34.

Zetterberg, H. On Theory and Verification in Sociology. Totowa, N.J.: The Bedminister Press, 1963.

Additional References

Bendix, R. Work and Authority in Industry, New York: Wiley, 1956.

Clark, T.N. "The Institutionalization of Innovation in Higher Education: Four Models," ASQ, 13, 1 (1968), 1-25.

Fliegal, F.C. and J.E. Kivlin. "Attributes of Innovations as Factors in Diffusion," AJS, 72,3(1966) 235-48.

Redlich, F. "Innovation in Business," American Journal of Economics and Sociology, 10 (1951), 285-91.

Rhenman, E. "Organizational Goals," in T. Agersnap (ed.) Contributions to the Theory of Organizations I, New York, Humanities Press, 1968, 75-87.

Schumpeter, J.A. "The Creative Response in Economic History," Journal of Economic History, 7 (1947), 149-59.

Simon, H.A. "On the Concept of Organizational Goal," ASQ, 9, 1(1964) 1-22.

Turk, H. "Summarizing Notes on Some Selections Relevant to Relations Between Complex Organizations," Los Angeles: Laboratory for Organizational Research, U.S.C., 1967 (mimeo).

Waldo, D. "Organization Theory: an Elephantine Problem," Public Administration Review, 21 (Autumn 1961), 210-25.

Wiesner, J.B. "Technology and Innovation," in D. Morse and A.W. Warner (eds.), Technological Innovation and Society, New York: Columbia University Press, 1966, 11-26.

Zand, D.E., M.B. Miles and W.O. Lytle, Jr. "Organizational Improvement Through Use of Temporary Problem Solving Systems," to appear in D.E. Zand and P.C. Buchanan (eds.), Organization Development: Theory and Practice (in press).